

A SHORT REVIEW OF NOTARIS (COLEOPTERA: CURCULIONIDAE).

BY L. L. BUCHANAN, U. S. Biological Survey, Washington, D. C.

To the three species of *Notaris* now listed from North America a fourth, the largest yet discovered, is here added. This apparently new weevil is represented by three specimens, all in at least fairly good condition, found in toads' stomachs.¹ The notes on the other species are based chiefly on material in the collections of the National Museum and Biological Survey.

The structural characters of *Notaris* are too well known to need repeating here, but one or two points relating to the sculpture of the elytra seem to be of enough general interest to warrant brief mention. The genus, as a whole, is quite definitely characterized by a peculiar kind of elytral sculpture which can be made out, in some degree or other of modification, in each of our four species. In its assumed simplest form, this sculpture consists of a system of fine anastomosing lines or reticulations, each cell thus formed, of which there are two to four in the width of an interval, enclosing a fine puncture. This stage of development of the sculpture is well illustrated in the species *aethiops*. The sculpture in *goliath* is much the same as in *aethiops*, except that the fine cross lines are a little wider and deeper, giving the appearance, from some angles, of transverse rugosities. In the assumed extreme development of the sculpture, as shown by *bimaculatus*, both cross and longitudinal anastomosing lines have become still wider and deeper, isolating, as a result, the intervening points which take the form of granules or minute tubercles, each one retaining the characteristic puncture on its posterior face. The re-

¹ The examination of a large number of toads' stomachs, recently made by Remington Kellogg in the Biological Survey Laboratory, has shown, among other things, that these lowly and often maligned creatures frequently perform valuable economic service as destroyers of noxious insects in agricultural environments; and also, that they may play the unexpected and, from the scientist's viewpoint, equally useful part of entomological collector. The toad, being active at times and under conditions peculiar to himself, captures many rare or even undescribed forms of invertebrate life, in addition to furnishing, through his long list of food items, some interesting facts regarding the distribution and abundance of the organisms eaten.

sulting surface texture is densely granulose in nature. About midway between *aethiops* and *bimaculatus* stands *puncticollis*, some specimens of which clearly show a gradual replacement of sutural reticulations and punctures with lateral granulations. These four sculptural modifications, though typical in a general way of the different species, are too variable for accurate use in identification, the instability being particularly true of *bimaculatus*, where the granules may be feebly elevated, flat-topped, and poorly defined. In occasional individuals of this same species, the two or three dorsal intervals near the suture have cells, granules, and all intermediate stages between these two, and in such cases the basic identity of the cells and granules is clearly disclosed.

The presence or absence of small spines at the apex of the tibiae, structures which were mentioned incidentally by Leconte '76, and Chittenden '06, supplies a positive and easily perceived means of splitting the genus. These spines rise from near the base of the mucro, projecting at right angles to it, and are only a little longer than the apical fringe of spinules. The fore tibia has one, the middle and hind tibiae two each, one on either side of the mucro; this arrangement is identical in both sexes. A similar set of spines occurs in the related genus *Procas*.

The four North American species or *Notaris* are separable as follows:

- A. Tibiae with small spines at apex (figs. 12 and 14), and with their inner edge not or feebly denticulate. Pygidium of male truncate or broadly rounded at apex, its inner surface not grooved. Antennal club slightly longer than the combined length of the preceding 4 funicular segments.
 - i. Length, 5-6.5 mm. Upper surface black, appearing glabrous, but with sparse, extremely fine recumbent hair. Elytral intervals with minute punctures and fine anastomosing lines; striae punctures smaller, close-set, sometimes more or less coalescent to form striae grooves. Prothoracic punctures coarse, moderately dense, but not forming rugae on dorsum. Beak stouter, less arcuate, 7th funicular segment twice as broad as long. Ocular lobes feeble. Fifth ventral segment of male $2\frac{1}{2}$ times as broad as long (53 to 20), the punctures subequal in size to those on the preceding segments; in female, this segment is less transverse and with smaller and denser punctures than on the other segments. Michigan, Colorado, Montana, Manitoba, Alberta, Hudson Bay Region,

and Alaska are the localities of the specimens seen.

aethiops Fab.

2. Length 4.5–6.5 mm. Upper surface mottled reddish-brown to black, distinctly pubescent. Elytral intervals more or less granulose or transversely rugose, more strongly so towards sides of elytra; strial punctures larger, quadrate, well separated to sub-contiguous but not forming strial grooves. Pronotal punctures denser and somewhat rugose. Seventh funicular segment only a little wider than long. Ocular lobes strong. Fifth ventral, male, just twice as broad as long, the punctures finer and denser, male and female, than on preceding segments. Ranges across the continent in the northern tier of states, south to Indiana and Colorado, north to Alberta. This is the common species east of the Mississippi River.

puncticollis Lec.

Aa. Tibiae simply mucronate at apex, coarsely denticulate along inner edge of fore and middle pair. Beak stouter, more arcuate and shining, punctures sparser. Middle of apical margin of male pygidium with an emargination which is the external mark of a longitudinal groove on its inner surface (not visible without dissection). Antennal club longer than preceding 3, but shorter than preceding 4, funicular segments combined. Ocular lobes strong.

3. Length 5.5–8.5 mm. Elytral intervals densely granulose, the striae, in places, feebly impressed or obscured by the sculpture. Prothoracic and abdominal punctuation coarse and dense, the punctures seldom separated by as much as their own diameter; punctures of head smaller than on pronotum, moderately dense, of beak still smaller and sparser. Seventh funicular segment sub-triangular and about as long as broad. Pygidial emargination deeper, inner groove distinct. Third elytral interval normally with a patch of pale scales behind the middle. Wisconsin, Iowa, North Dakota, South Dakota, Wyoming, Montana, and Mackenzie. Europe.

bimaculatus Fab. (*wyomingensis* Chttm.)

4. Length, 9–11 mm. Elytral intervals punctulate and with reticulate lines, the sculpture appearing transversely rugose from some angles; striae distinct and uninterrupted. Sculpture above and below much sparser. Seventh funicular segment transverse. Pygidial emargination broad, the inner groove feeble. No pale spot on 3rd interval. Nevada and Oregon ***goliath*** n. sp.

Notaris goliath n. s.

Oblong, black; head, prothorax, and under surface shining, elytra dull; vestiture consisting of hair-like, yellowish-brown,

prostrate scales, a little broader and denser along sides of pronotum. Length of type, male, 11 mm.

This species, in outline and general structure, is a close copy of *bimaculatus*. The characters in which it differs from that species, in addition to the points brought out in the key and figures, are: Punctures of head minute and sparse; punctures of pronotum large but irregularly spaced, and varying from close to sparse in an area on either side of the smooth median line; abdominal punctures on first 4 segments smaller and sparser; elytra with the striae sharply defined, the vestiture (which is prostrate as in the other species) more slender and hair-like. The smallest of the 3 specimens is $\frac{1}{2}$ mm. longer than the largest *bimaculatus* seen, although the latter species is said to attain a length of 10 mm. in Europe. In the female the beak is about $\frac{1}{10}$ longer than in the male, and with the tip of scrobe located at $\frac{3}{5}$ from base. The tip of scrobe in the male is slightly more advanced in position. Expressed in ratio form, that portion of the female beak anterior to the tip of scrobe is to the corresponding portion in the male as 4 is to 3.

Type locality.—Carson, Nevada. Two specimens (male type, and female paratype) from stomach of *Bufo boreas*, Biol. Survey No. 900.

Other locality.—Fort Klamath, Oregon. (1 female paratype.) Stomach of *Bufo boreas*, No. 546.

Type.—Cat. No. 40098 U. S. N. M.

The 2 female paratypes are deposited in the Biological Survey collection.

EXPLANATION OF PLATE I.

(All figures are from the male.)

Figs. 1, 2, and 3. Side view of head and beak of *bimaculatus*, *puncticollis*, and *aethiops*.

Figs. 4, 5, 6, and 7. Sixth and seventh funicular segments, and club, of *puncticollis*, *aethiops*, *bimaculatus*, and *goliath*.

Figs. 8 and 9. Lateral and dorsal views of median lobe of male genitalia of *goliath*.

Fig. 10. Pronotum of *bimaculatus*, to show the coarse, dense punctuation.

Fig. 11. Dorsal view of *goliath*.

Fig. 12. Fore tibia of *aethiops*.

Fig. 13. Fore tibia of *bimaculatus*.

Fig. 14. Middle tibia of *puncticollis*.

Figs. 15, 16, and 17. Antero-ventral margin of prothorax of *aethiops*, *puncticollis*, and *bimaculatus*.

